



Sarvodaya Kelavani Samaj Managed

Shri Manibhai Virani & Smt. Navalben Virani Science College, Rajkot

(Autonomous)

Affiliated to Saurashtra University, Rajkot

Reaccredited at the “A” Level (CGPA 3.28) by NAAC

“STAR” College Scheme & Status by MST-DBT

A College with Potential for Excellence – CPE (Phase - II) by UGC

Accredited at the G-AAA Highest Grade ‘A-1’ Level by KCG, Govt. of Gujarat

UGC-DDU KAUSHAL Kendra

GPCB-Government of Gujarat approved Environmental Audit Centre

SCHEME OF LEARNING AND EVALUATION

(based on the recommendations for 4 years UG program under the Curriculum and Credit Framework for Undergraduate Programs – guidelines / framework / regulations of UGC , Gujarat Government and affiliating Saurashtra University in light of NEP-2020)

Of

**Bachelor of Science (Honors/Honors with Research (FYUGP))
– Biochemistry Programme**

(W.e.f June 2023)

Shri Manibhai Virani and Smt. Navalben Virani Science College, Rajkot

(An Autonomous College affiliated to Saurashtra University, Rajkot)

Department of Biochemistry

B. Sc. BIOCHEMISTRY

VISION:

To be a prime centre in area of biochemical sciences by enhancing the quality of life through holistic education and research

MISSION:

- To encourage innovation and creativity towards better understanding of life at molecular level.
- To foster the culture of scientific understanding, curiosity and critical thinking for professional as well as academic excellence.
- To promote quality research and other scholarly activities for sustainable industrial development and healthy life style.
- To inculcate leadership, morality, spirituality, accountability, integrity and social equality among the students.

OBJECTIVES OF THE PROGRAMME:

The Curriculum is designed to attain the following learning goals which students shall accomplish by the time of their graduation:

1. Understand the basic concepts of life Science from molecular to organisms' level.
 2. Apply basic principle of analytical techniques and use effectively basic and modern laboratory instruments.
 3. Effectively use knowledge of Biochemistry in healthy living and better management of diseases.
 4. Design, perform simple experiments in clinical biochemistry and interpret data to derive conclusion.
- **Graduate attributes**
 - **Academic excellence:** Ability to identify key questions, research and pursue rigorous evidence-based arguments
 - **Critical Thinking and Effective communications:** Analysis and evaluation of information to form a judgement about a subject or idea and ability to effectively communicate the same in a structured form.

- **Global Citizenship:** Mutual understanding with others from diverse cultures, perspectives and backgrounds
- **Life Long Learning:** Open, curious, willing to investigate, and consider new knowledge and ways of thinking

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

Our programme will produce Graduates who will attain following PEOs after few years of graduation	
PEO 1	: Core competency: will be competent in the field of biochemistry and allied areas by providing them hands on experience in basic tools and techniques.
PEO 2	: Breadth of knowledge: will critically analyse scientific data, draw objective conclusions and apply this knowledge for human welfare.
PEO 3	: Preparedness: Will reflect ability for research and entrepreneurship along with strong ethics and communication skills.
PEO 4	: Professionalism: will reveal strong professional ethics and moral duties that will positively affect their profession, community, society and Nation at large.
PEO 5	: Learning environment: will show attitude of lifelong learning to meet the ever evolving professional demands by developing ethical, interpersonal and team skills.

PROGRAM OUTCOMES:

After completion of the programme the Graduate will be able to :	
PO 1	: Domain knowledge: Demonstrate an understanding of fundamental biochemistry principles, including topics specific to chemistry and biochemistry.
PO 2	: Problem analysis: Identify and critically analyse pertinent problems in the various domains of life sciences.
PO 3	: Design/development of solutions: using appropriate tools and techniques as well as approaches to arrive at viable conclusions/solutions pertaining to life sciences.
PO 4	: Conduct investigations of complex problems: Cultivate the skills to Employ modern library search tools to locate and retrieve scientific information about a problem relating to biochemistry.
PO 5	: Modern tool usage: Ability to handle/use appropriate chemical and biochemical experiments using tools/techniques/equipment with an understanding of the standard operating procedures, safety aspects/limitations.
PO 6	: The Biochemist and society: Demonstrate the ability to understand the role of scientific developments, particularly, biological sciences in a changing world from the disciplinary perspective as well as in relation to its professional and everyday use.
PO 7	: Environment and sustainability: Analyse the impact of scientific and technological

		advances on the environment and society and the need for sustainable development.
PO 8	:	Ethics: Commitment to professional ethics and responsibilities.
PO 9	:	Individual and team work: Exhibit the potential to effectively accomplish tasks independently and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	:	Communication: Communicate effectively in spoken and written form as well as through electronic media with the scientific community as well as with society at large. Demonstrate the ability to write dissertations, reports, make effective presentations and documentation.
PO 11	:	Project management and finance: Demonstrate knowledge and scientific understanding to identify research problems, design experiments, generation of new scientific insights or to the innovation of new applications of Biochemistry research and provide solutions. Exhibit organizational skills and the ability to manage time and resources.
PO 12	:	Life-long learning: Ability to retain and build on critical thinking skills, and use them to update scientific knowledge and apply them in day to day business.

PROGRAM SPECIFIC OUTCOMES (PSOs) for B. Sc. Biochemistry program

After completion of the program the Graduate will:		
PSO1	:	Communicate the fundamental concepts of biomolecules, enzymes, cell structure, organ system and metabolism.
PSO2	:	Undertake the experiments and derive conclusions by using classical and advanced instruments employed in the area of biochemistry, biotechnology, molecular biology and immunology.
PSO3	:	Understand, identify, formulate and solve the problems of endocrine disorders in the area of hormone biochemistry.
PSO4	:	Appreciate and apply understandings and skills of molecular diagnosis as well as analytical techniques for the development of professional and research career in environment, industry, agriculture and healthcare sector.
PSO5	:	Become competent and eligible to appear in various competitive exams, doing jobs in government and private sector of academia, research and industries

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Department of Biochemistry
Bachelor of Science (Hon/Hon with Research (FYUGP))
SCHEME OF LEARNING AND EVALUATION

For the students admitted from A.Y. 2023-2024 & onwards
NCrF- Level 4.5: First Year FYUGP: Semester I & II (UG Certificate in Sciences)

Semester I									
Course Code	Course	Contact Hrs./ week			SEE Duration (Hours)	Maximum Marks			Credits
						CIA	SEE	Total	
Part-I: Ability Enhancement Courses (Language)									
		T	Tu	P					
	English - I	2	-	-	3	2 Assg	50	50	2
Part-I Total		2	0	0		-	50	50	2
Part-II: Discipline Specific Core Courses									
Major Core / DSC/ IDMajor									
	Core 1: Biomolecules	4	-	-	3	30	70	100	4
	Core 2: Microbiology – I	4	-	-	3	30	70	100	4
	Core Practical-1: Biochemistry- I	-		4	4	15	35	50	2
	Core Practical -2: Microbiology – I	-		4	4*	15	35	50	2
Minor Stream / DMi / IDMiCore Courses									
	DMi Core 1: Biology – I	4	-	-	3	30	70	100	4
	DMi Core Practical- 1: Biology – I			4	4*	15	35	50	2
Multi-Disciplinary Courses:(MDC)									
	MDC 1:	2	-	-	2	50	-	50	2
Skill Enhancement Courses (SEC Major & Minor)									
	Basic Laboratory Techniques	1	-	-	2	50	-	50	1
Part-II Total		15	0	12		235	315	550	21
Part-III									
Common Value-Added Course (CVAC)									
	Jeevan Vidya	1	-	-	-	50	-	50	1
		18	0	12					

	Part-I+II+III Total	30		285	365	650	24
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Multi-disciplinary course offered by the Department to Semester – I students of other Departments.

Multi-disciplinary course (MDC)									
	Biochemistry in Health and Disease	2	-	-	2	50	-	50	2

*** 2 days practical exam:2hrs on day 1 and 2hrs on day 2**

SCHEME OF LEARNING AND EVALUATION
For the students admitted from A.Y. 2023-2024& onwards

Semester II									
Course Code	Course	Contact Hrs. / week			SEE Duration (Hours)	Maximum Marks			Credits
						CIA	SEE	Total	
Part-I: Ability Enhancement Courses (Language)									
		T	Tu	P					
	English - II	2	-	-	3	2 Assg	50	50	2
	Part-I Total	2	0	0		-	50	50	2
Part-II: Discipline Specific Core Courses									
Major Core / DSC/ IDMajor									
	Core 3:	4	-	-	3	30	70	100	4
	Core 4:	4	-	-	3	30	70	100	4
	Core Practical-3:	-		4	4*	15	35	50	2
	Core Practical -4:	-		4	4*	15	35	50	2
Minor Stream / DMi / IDMiCore Courses									
	DMi Core 2:	4	-	-	3	30	70	100	4
	DMi Core Practical- 2:			4	4*	15	35	50	2
Multi-Disciplinary Courses:(MDC)									
	MDC 2:	2	-	-	2	50	-	50	2
Skill Enhancement Courses (SEC Major & Minor)									
	SEC – 2: (Major)	1	-	-	2	50	-	50	1
	Part-II Total	15	0	12		235	315	550	21
Part-III									
Common Value-Added Course (CVAC)									
	CVAC – 2	1	-	-	-	50	-	50	1
		18	0	12					
	Part-I+II+III Total	30				285	365	650	24

Multi-disciplinary course offered by the Department to Semester – II students of other Departments.

Multi-disciplinary course (MDC)									
	MDC 2:	2	-	-	2	50	-	50	2

* 2 days practical exam: 2hrs on day 1 and 2hrs on day 2

SCHEME OF LEARNING AND EVALUATION
For the students admitted from A.Y. 2023-2024 & onwards
NCrF- Level 5: Second Year FYUGP: Semester III & IV (UG Diploma in Sciences)

Semester III									
Course Code	Course	Contact Hrs. / week			SEE Duration (Hours)	Maximum Marks			Credits
		T	Tu	P		CIA	SEE	Total	
Part-I: Ability Enhancement Courses (Language)									
	English – III	2	-	-	3	2 Assg	50	50	2
Part-I Total		2	0	0		-	50	50	2
Part-II: Discipline Specific Core Courses									
Major Core / DSC/ IDMajor									
	Core 5:	4	-	-	3	30	70	100	4
	Core 6:	4	-	-	3	30	70	100	4
	Core Practical-5:	-		4	4*	15	35	50	2
	Core Practical -6:	-		4	4*	15	35	50	2
Minor Stream / DMi / IDMiCore Courses									
	DMi Core 3:	4	-	-	3	30	70	100	4
	DMi Core Practical- 3:			4	4*	15	35	50	2
Multi-Disciplinary Courses:(MDC)									
	MDC 3:	2	-	-	2	50	-	50	2
Skill Enhancement Courses (SEC Major & Minor)									
	SEC – 3: (Major)	1	-	-	2	50	-	50	1
Part-II Total		15	0	12		235	315	550	21
Part-III									
Common Value-Added Course (CVAC)									
	CVAC –3	1	-	-	-	50	-	50	1
		18	0	12					
Part-I+II+III Total		30				285	365	650	24

Multi-disciplinary course offered by the Department to Semester – III students of other Departments.

Multi-disciplinary course (MDC)									
	MDC 3:	2	-	-	2	50	-	50	2

* 2 days practical exam:2hrs on day 1 and 2hrs on day 2

SCHEME OF LEARNING AND EVALUATION
For the students admitted from A.Y. 2023-2024& onwards

Semester IV									
Course Code	Course	Contact Hrs. / week			SEE Duration (Hours)	Maximum Marks			Credits
		T	Tu	P		CIA	SEE	Total	
Part-I: Ability Enhancement Courses (Language)									
	English – IV	2	-	-	3	2 Assg	50	50	2
Part-I Total		2	0	0		-	50	50	2
Part-II: Discipline Specific Core Courses									
Major Core / DSC/ IDMajor									
	Core 7:	4	-	-	3	30	70	100	4
	Core 8:	4	-	-	3	30	70	100	4
	Core Practical-7:	-		4	4*	15	35	50	2
	Core Practical -8:	-		4	4*	15	35	50	2
Minor Stream / DMi / IDMiCore Courses									
	DMi Core 4:	4	-	-	3	30	70	100	4
	DMi Core Practical- 4:			4	4*	15	35	50	2
Multi-Disciplinary Courses:(MDC)									
	MDC 4: TDE 1	1	-	-	2	50	-	50	1
Skill Enhancement Courses (SEC Major & Minor)									
	SEC – 4: CoC	2	-	-	2	50	-	50	2
Part-II Total		15	0	12		235	315	550	21
Part-III									
Common Value-Added Course (CVAC)									
	CVAC –4	1	-	-	-	50	-	50	1
		18	0	12					
Part-I+II+III Total		30				285	365	650	24

Multi-disciplinary course offered by the Department to Semester – IV students of other Departments.

Multi-disciplinary course (MDC)

	MDC 4: TDE 1	2	-	-	2	50	-	50	2
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* 2 days practical exam:2hrs on day 1 and 2hrs on day 2

SCHEME OF LEARNING AND EVALUATION
For the students admitted from A.Y. 2023-2024& onwards
NCrF- Level 5.5: Third Year FYUGP: Semester V&VI (B.Sc. in Microbiology)

Semester V									
Course Code	Course	Contact Hrs. / week			SEE Duration (Hours)	Maximum Marks			Credits
		T	Tu	P		CIA	SEE	Total	
Part-I: Ability Enhancement Courses (Language)									
		T	Tu	P					
	MIL – Hindi**	2	-	-	3	2 Assg	50	50	2
Part-I Total		2	0	0		-	50	50	2**
Part-II: Discipline Specific Core Courses									
Major Core / DSC/ IDMajor									
	Core 9:	4	-	-	3	30	70	100	4
	Core 10:	4	-	-	3	30	70	100	4
	Core 11:	4	-	-	3	30	70	100	4
	Core Practical-9:	-		4	4*	15	35	50	2
	Core Practical -10:	-		4	4*	15	35	50	2
	Core Practical -11:	-		4	4*	15	35	50	2
Core Elective									
	Core Elective 1:	3	-	-	3	30	70	100	3
Research Project / Dissertation									
	Minor Research Project (Ma) / Industrial visit / Training**	-	-	-	-	Evaluation in the 6 th Semester			-
Skill Enhancement Courses (SEC Major & Minor)									
	SEC – 5: Internship (Major)	-	-	4	-	50	-	50	2
Part-II Total		15	0	16		215	435	600	23
Part-III									
Common Value-Added Course (CVAC)									
	CVAC –5	1	-	-	-	50	-	50	1

		16/18	0	16					
	Part-I+II+III Total	32/34				285	365	650	24

* 2 days practical exam: 2hrs on day 1 and 2hrs on day 2

** Extra Credit course

SCHEME OF LEARNING AND EVALUATION
For the students admitted from A.Y. 2023-2024 & onwards

Semester VI									
Course Code	Course	Contact Hrs. / week			SEE Duration (Hours)	Maximum Marks			Credits
		T	Tu	P		CIA	SEE	Total	
Part-I: Ability Enhancement Courses (Language)									
		T	Tu	P					
	MIL – Hindi**	2	-	-	3	2 Assg	50	50	2
	Part-I Total	2	0	0		-	50	50	2**
Part-II: Discipline Specific Core Courses									
Major Core / DSC/ IDMajor									
	Core 12:	4	-	-	3	30	70	100	4
	Core 13:	4	-	-	3	30	70	100	4
	Core 14:	4	-	-	3	30	70	100	4
	Core Practical-12:	-		4	4*	15	35	50	2
	Core Practical -13:	-		4	4*	15	35	50	2
	Core Practical -14:	-		4	4*	15	35	50	2
Core Elective									
	Core Elective 2:	3	-	-	3	30	70	100	3
Multi-Disciplinary Courses:(MDC)									
	MDC 5: TDE 2	1	-	-	2	50	-	50	1
Research Project / Dissertation									
	Minor Research Project (Ma) / Industrial visit / Training**	-	-	-	-	Evaluation in the 6 th Semester			2**
Skill Enhancement Courses (SEC Major & Minor)									
	SEC – 6: CRT* +SS (NCC)*	1	-		-	50	-	50	1
	Part-II Total	17	0	16		265	435	650	23

Part-III									
Common Value-Added Course (CVAC)									
	CVAC –6	1	-	-	-	50	-	50	1
		17/19	0	16					
	Part-I+II+III Total	33/35				315	435	700	24

* Non-credit compulsory course

SCHEME OF LEARNING AND EVALUATION
For the students admitted from A.Y. 2023-2024 & onwards
NCrF- Level 6: Fourth Year FYUGP: Semester VII & VIII
(B.Sc. Honours or B.Sc. Honours with Research)

Semester VII(B.Sc. Honours)									
Course Code	Course	Contact Hrs. / week			SEE Duration (Hours)	Maximum Marks			Credits
						CIA	SEE	Total	
Part-II: Discipline Specific Core Courses									
Major Core / DSC/ IDMajor									
	Core 15:	4	-	-	3	30	70	100	4
	Core 16:	4	-	-	3	30	70	100	4
	Core 17:	4	-	-	3	30	70	100	4
	Core Practical-15:	-	-	4	4*	15	35	50	2
	Core Practical -16:	-	-	4	4*	15	35	50	2
	Core Practical -16:	-	-	4	4*	15	35	50	2
Core Elective									
	Core Elective 3:	4	-	-	3	30	70	100	4
	Core Elective 3 Practical:	-	-	4	4*	15	35	50	2
	Part-II Total	16	0	16		180	420	600	24
	Part-I+II+III Total	32				180	420	600	24

* 2 days practical exam: 2hrs on day 1 and 2hrs on day 2

SCHEME OF LEARNING AND EVALUATION
For the students admitted from A.Y. 2023-2024 & onwards

Semester VIII(B.Sc. Honours)									
Course Code	Course	Contact Hrs. / week			SEE Duration (Hours)	Maximum Marks			Credits
						CIA	SEE	Total	

Part-II: Discipline Specific Core Courses									
Major Core / DSC/ IDMajor									
	Core 18:	4	-	-	3	30	70	100	4
	Core 19:	4	-	-	3	30	70	100	4
	Core 20:	4	-	-	3	30	70	100	4
	Core Practical-18:	-	-	4	4*	15	35	50	2
	Core Practical -19:	-	-	4	4*	15	35	50	2
	Core Practical -20:	-	-	4	4*	15	35	50	2
Core Elective									
	Core Elective 4:	4	-	-	3	30	70	100	4
	Core Elective 4 Practical:	-	-	4	4*	15	35	50	2
Part-II Total		16	0	16		180	420	600	24
Part-I+II+III Total		32				180	420	600	24

* 2 days practical exam:2hrs on day 1 and 2hrs on day 2

SCHEME OF LEARNING AND EVALUATION
For the students admitted from A.Y. 2023-2024& onwards
NCrF- Level 6: Fourth Year FYUGP: Semester VII & VIII
(B.Sc. Honours or B.Sc. Honours with Research)

Semester VII (B.Sc. Honours with Research)									
Course Code	Course	Contact Hrs. / week	SEE Duration (Hours)	Maximum Marks			Credits		
				CIA	SEE	Total			
Part-II: Discipline Specific Core Courses									
Major Core / DSC/ IDMajor									
	Core 15:	4	-	-	3	30	70	100	4
	Core 16:	4	-	-	3	30	70	100	4
	Core 17:	4	-	-	3	30	70	100	4
	Core Practical-15:	-	-	4	4*	15	35	50	2
	Core Practical -16:	-	-	4	4*	15	35	50	2
	Core Practical -16:	-	-	4	4*	15	35	50	2
Core Elective									
	Core Elective 3:	4	-	-	3	30	70	100	4
	Core Elective 3 Practical:	-	-	4	4*	15	35	50	2
Part-II Total		16	0	16		180	420	600	24
Part-I+II+III Total		32				180	420	600	24

* 2 days practical exam:2hrs on day 1 and 2hrs on day 2

SCHEME OF LEARNING AND EVALUATION
For the students admitted from A.Y. 2023-2024& onwards

Semester VIII (B.Sc. Honours with Research)

Course Code	Course	Contact Hrs. / week			SEE Duration (Hours)	Maximum Marks			Credits
						CIA	SEE	Total	
Part-II: Discipline Specific Core Courses									
Major Core / DSC/ IDMajor									
	Core 21 including MOOC	4	-	-	3	30	70	100	4
	Core 22 including MOOC	4	-	-	3	30	70	100	4
Research Project									
	Major Research Project	4	-	24	3	120	280	400	16
Part-II Total		12	0	24		180	420	600	24
Part-I+II+III Total		36				180	420	600	24